

(19)



(11)

EP 1 552 101 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent:

09.09.2015 Bulletin 2015/37

(51) Int Cl.:

E06B 3/68 (2006.01)

(21) Application number: **03771183.5**

(86) International application number:

PCT/GB2003/003265

(22) Date of filing: **25.07.2003**

(87) International publication number:

WO 2004/011756 (05.02.2004 Gazette 2004/06)

(54) IMPROVEMENTS IN AND RELATING TO GLAZING CLIPS FOR ANCILLARY ELEMENTS ON GLAZING UNITS

VERBESSERUNGEN VON GLASKLAMMERN UND DIESE BETREFFEND FÜR ZUSATZELEMENTE AN GLASEINHEITEN

AMELIORATIONS PORTANT SUR DES ATTACHES DE VITRES POUR ELEMENTS ADDITIONNELS MONTES SUR DES VITRES

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT RO SE SI SK TR

(72) Inventor: **Longden, Paul,**
The Real Georgian Bar Company Ltd.
Scunthorpe, DN16 1AD (GB)

(30) Priority: **26.07.2002 GB 0217323**

(74) Representative: **Appleyard Lees**
15 Clare Road
Halifax HX1 2HY (GB)

(43) Date of publication of application:
13.07.2005 Bulletin 2005/28

(73) Proprietor: **The Real Georgian Bar Company Limited**
Kent, BR6 ONG (GB)

(56) References cited:
EP-A- 0 152 813 EP-A- 0 641 913
WO-A-01/61136 GB-A- 2 070 118
US-A- 2 723 427 US-A- 2 934 180

EP 1 552 101 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

DescriptionField of the Invention

[0001] The present invention relates to glazing clips, glazing assemblies, kits for the construction of ancillary elements on a glazing unit and to methods of construction of glazing assemblies.

Background to the Invention

[0002] A typical glazing assembly comprises a sealed double glazed unit about the edge of which is provided a foursided frame. The sealed glazing unit comprises a first glazing panel, typically of glass, in a spaced, parallel, face to face relationship with a similar second glazing panel. At the peripheral edge of the glazing panels and about their edges, a beading is provided, typically a poly vinylchloride (PVC) material to maintain the spaced apart relationship and to prevent the ingress of water between the panels. The frame is typically a PVC moulding with PVC nitrile gaskets for receiving the glazing unit. A first side of a glazing unit is intended to be an interior panel and a second side as exterior panel, in use.

[0003] Some customers desire an effect on their windows such as the appearance of a Georgian bar thereon. A Georgian bar is a cross or trellis effect on the glazing assembly giving the appearance that the glazing is made up of multiple smaller glazing panels in a plane.

[0004] For reasons of manufacturing complexity, it is undesirable to manufacture genuine Georgian windows, but the appearance is often sought.

[0005] US 2 854 709 discloses a glazing clip extending around opposed face of a sheet of glass and including an integral anchoring leg with points intended to bite into a peripheral frame.

[0006] US 2 723 427 discloses a glazing clip extending around opposed faces of a glazing panel with legs to provide engagement with a glazing compound at the periphery of the panel.

[0007] US 2 637 423 discloses a glazing clip extending over one side only of a sheet of glass, to engage with a sash bar of a special design to press and hold a glass sheet in position at the periphery of the glazing.

[0008] GB 659, 839 discloses a glazing clip having a channelled part for receiving the peripheral edge of a sheet of glass.

[0009] GB 2 010 948 discloses a glazing clip for receiving the peripheral edge of a sheet of glass and is of a general U shape extending over opposed faces of the pane.

[0010] US 2 934 180 discloses a batten strip for interconnecting structural elements, the strip being U or H shaped and extending over the periphery of the structural elements.

[0011] EP-A-0152813 discloses a kit for incorporating a Georgian effect bar on a window, the kit of comprising for one edge of a glazing panel, pair of end-engaging

elements each end-engaging element receiving an extruded plate from which extends an upstanding portion onto which a Georgian bar effect cover is applied.

[0012] It is an aim of preferred embodiments of the present invention to obviate or overcome a problem associated with the prior art, whether referred to herein or otherwise.

Summary of the Invention

[0013] According to the present invention in a first aspect, there is provided a kit according to claim 1.

[0014] Further features of the present invention are set out in the appended claims.

Brief Description of the Drawings

[0015] The present invention will now be described by way of example only, with reference to the drawings that follow; in which:

Figure 1 is a front view of a glazing clip according to the present invention.

Figure 2 is a side view of the glazing clip shown in Figure 1.

Figure 3 is a perspective view of the glazing clip shown in Figures 1 and 2.

Figure 4 is a front view of a cross-piece for use with the present invention.

Figure 5 is a side view of the cross-piece shown in Figure 4.

Figure 6 is a perspective view of a kit according to the present invention.

Figure 7 is a cross-sectional elevation of an ancillary element for use with the present invention.

Figure 8 is a perspective view of a first stage in a method of construction according to the present invention.

Figure 9 is a perspective view of a second stage in a method of construction according to the present invention.

Figure 10 is a perspective view of a third stage in a method of construction according to the present invention.

Figure 11 is a perspective view of a fourth stage in a method of construction according to the present invention.

Figure 12 is a perspective view of a fifth stage in a method of construction according to the present invention.

Figure 13 is a perspective view of a sixth stage in a method of construction according to the present invention.

Description of the Preferred Embodiments

[0016] Referring to Figures 1-3 of the drawings that follow, there is shown a glazing clip 2 having a generally U-shaped body 4 from which extend means for interengaging with an ancillary element. The means for interengaging with an ancillary element comprise a first interengaging member 6 and a second interengaging member 8.

[0017] The generally U-shaped body 4 comprises a base 10 from which extend two substantially similar arms 12, 14 towards the distal end of which the first and second interengaging members 6, 8 lie.

[0018] As shown most clearly in Figure 2 of the drawings, the arms 12, 14 of the U-shaped body 4 are inclined slightly from perpendicular with the base 10. That is the gap between the distal end of the arms 12, 14 is less than the distance between the other end of the arms 12, 14 at the base end.

[0019] Each interengaging member 6, 8 comprises an upstanding portion extending from the corresponding arm 12, 14, which upstanding portion comprises a male member (for interengagement with a female member as described below), which has a plurality of rebated portions therefore. The first and second interengaging members extend for just over half the length of the arms 12, 14 from the distal end thereof.

[0020] The glazing clip is formed from a rigid thermoplastic material by injection moulding.

[0021] Referring to Figures 4 and 5 of the drawings that follow, there is shown a cross-piece 20. The cross-piece 20 comprises a planar base 22 upstanding from which is a first interengaging member 24, a second interengaging member 26 and a third interengaging member 28. The base 22 is generally an elongate rectangle across the width of which extends first interengaging member 24. Generally perpendicular to the first interengaging member 24 and running parallel to the length of base 22 are second and third interengaging members 26, 28. Corresponding gaps 30, 32 are provided between first and second and first and third interengaging members. Interengaging members 24, 26, 28 are substantially similar to the interengaging members 6, 8 of glazing clip 2.

[0022] Referring to Figure 6 of the drawings that follow, there is shown a kit of parts according to the present invention, the kit comprising four substantially similar glazing clips 2, two cross pieces 20 and two lots of three ancillary elements 40, 42, 44 cut to length. It is noted that an ancillary element may be provided as a single piece and cut to suitable lengths on site.

[0023] A known ancillary element 40 is shown in Figure 7 for producing a Georgian bar effect. Each ancillary element is of a substantially similar cross-section. The ancillary element 40 comprises a generally n-shaped Georgian bar cover 46 with co-extruded gaskets 48, 50 extending from the depending arms thereof. In the interior (in use) of the ancillary element 40 there is a female part of an interengaging member 52 suitable for interengaging with any of the interengaging members of the glazing clip 2 or cross-piece 20. The ancillary element 40 has a lower face 53 intended, in use, to lie against or over a glazing panel, as described below. The width of body 4 of glazing clip 2 is no more than the width of the ancillary element so the latter substantially hides the former in use.

[0024] A method of usage of the preferred embodiment of the present invention will now be described with reference to Figures 8-13 of the drawings that follow.

[0025] Referring to Figure 8 of the drawings that follow, a glazing unit 60 is a double glazing unit of known type with interior (ie between the two glazing panels) cross members, an internal Georgian bar 62. The interior cross members are a known optional but desirable feature to enhance the final appearance of the product.

[0026] In the first step of construction of a glazing assembly according to the present invention, glazing clips 2 are fitted to each edge of the glazing unit 60 to suit the position of the internal Georgian bar 62. The slight incline of the arms 12, 14 of the glazing clips 2 means that once the four clips 2 have been slid over the edge of glazing unit 60 they hold themselves in place.

[0027] Accordingly a glazing clip 2 is provided over each edge of the glazing unit 60 with an interengaging means on each side of the glazing unit 60. That is, first interengaging member 6 is on one side of the glazing unit and second interengaging member 8 is on the other side of the glazing unit.

[0028] If there is no internal Georgian bar 62 then the glazing clips 2 are fitted around the sealed glazing unit 60 to suit the position of the spacer bar.

[0029] Referring to Figure 9 of the drawings that follow, in the next step the glazing unit 60 is installed into a known frame 64 in the normal manner. It is recommended that it is checked that the clips 2 are in the right position before final beading of the assembly is carried out.

[0030] It is noted that the frame 64 incorporates gasket elements (not shown) for receiving the glazing unit 60 therein, which gaskets provide sufficient leeway for the relatively thin (typically, the wall size is 1mm) glazing clips 2 to extend across the edge of the glazing unit 60 without interfering with the fitting of the glazing unit 60 in the frame 64.

[0031] Referring to Figure 10 of the drawings that follow, in a next step the shortest full span ancillary element 40, which will be one of the final external Georgian bar elements, is cut (if required) and mitred (if required) to the length required for fitting into the frame 64.

[0032] Next, with reference to Figure 11 of the drawings that follow, the cross-piece 20 is fitted with first in-

terengaging member in the female interengaging member 52 thereof. The cross-piece 20 is located centrally on the ancillary element 40. The ancillary element 40 is then push fitted as a snap-fit on to the exposed interengaging members 6 of the glazing clips 2.

[0033] In the next step as shown with reference to Figures 12 and 13 of the drawings that follow, the remaining ancillary elements 42 and 44 are, if necessary, cut to length and mitred. Ancillary elements 42, 44 are then push fitted on to interengaging members 6 (of glazing clips 2) and the second and third interengaging members 26, 28 of the cross-piece.

[0034] The lower face 53, therefore lies against the glazing panel 60. The interengaging member 6 thus interengages with the ancillary element 42 in the lower face 53 thereof by a snap fit connection. Thus a longitudinal slot 55 is provided to receive interengaging means 6.

[0035] Thus, one side of the glazing unit has the appearance of a Georgian bar with a single cross.

[0036] The procedure is then repeated on the reverse side of the glazing unit 60 for the ancillary elements therefor.

[0037] For multiple cruciform configurations the process is repeated at every junction. It is recommended that the shortest full span for a continual ancillary element bar is used to maximise the rigidity of the system. If required a small double sided tape patch (not shown) may be applied at each cross piece between the cross piece and the glazing panel, or alternatively a thin bead of translucent silicone (not shown) may be used. This helps secure the cross piece in the long term and reduces the risk of rattling.

[0038] Thus, by using embodiments of the present invention a single glazing clip can provide interengaging members on one or both sides of a glazing unit. The interengaging members are inherently aligned and do not interfere with the frame because of the thin body of the clip. A pleasing Georgian effect window assembly can, therefore, be provided.

[0039] It will be appreciated that the present invention is suitable for glazing units having any number of glazing panels from one upwards, requiring only an adjustment of the length of the base. It will also be appreciated that the order of the method of construction described above can be altered somewhat if desired.

Claims

1. A kit comprising a plurality of glazing clips for being fitted onto a glazing unit and a plurality of ancillary elements, each glazing clip (2) comprising a generally U-shaped body (4) having a base (10) and opposing arms (12, 14), wherein the base is configured to extend across an edge of a glazing unit, in use, with each arm extending over a respective external face of a glazing panel on opposite sides thereof, wherein each glazing clip is of a one-piece construc-

tion and comprises an upstanding portion (6, 8) projecting from each arm interengaging with an ancillary element (40, 42, 44) which comprises a generally n-shaped Georgian bar cover configured to provide a Georgian bar effect glazing assembly on a glazing panel.

2. A kit as claimed in claim 1, wherein the arms of the glazing clip are inclined from the perpendicular relative to the base, whereby in use the glazing clip is biased to the glazing unit.

3. A kit as claimed in claim 1, wherein the upstanding portion comprises a plurality of rebated portions.

4. A kit as claimed in claim 1, wherein the upstanding portion comprises a mushroom formation.

5. A kit as claimed in any preceding claim, wherein the kit further comprises a cross-piece for interengaging with a first ancillary element in a first direction and with a second ancillary element in a second direction.

6. A kit as claimed in claim 5, wherein the cross-piece comprises a first interengaging member for interengaging with a first ancillary element and a second interengaging member for interengaging with a second ancillary element.

7. A kit as claimed in claim 6, wherein the cross-piece further comprises a third interengaging member for interengaging with a third ancillary element.

8. A kit as claimed in claim 7, wherein the cross-piece is configured whereby a first ancillary element will be substantially perpendicular to a second and a third ancillary element.

9. A kit as claimed in claim 7 or claim 8, wherein the first interengaging member is substantially similar in cross-section to the second interengaging member and/or the first interengaging member is substantially similar in cross-section to the third interengaging member.

10. A kit as claimed in any one of claims 7 to 9, wherein the first interengaging member is substantially perpendicular to the second interengaging member and/or the first interengaging member is substantially perpendicular to the third interengaging member.

11. A kit as claimed in any preceding claim, wherein the ancillary element is of substantially constant cross-section.

12. A kit as claimed in any preceding claim, wherein the ancillary element comprises a lower face to be against a glazing panel in use, and the glazing clip

is configured to interengage with the ancillary element in the lower face.

13. A kit as claimed in claim 12, wherein the lower face has a longitudinal slot therein for receiving the glazing clip.
14. A kit as claimed in claim 12 or claim 13, wherein the ancillary element and glazing clip interengage by a snap-fit connection.
15. A glazing assembly comprising a glazing unit about the edge of which are a plurality of glazing clips according to any one of claims 1 to 4 and a plurality of ancillary elements according to any one of claims 1 to 4 engaged with the glazing clips.
16. A method of construction of a glazing assembly, the method comprising the steps of providing a plurality of glazing clips according to any one of claims 1 to 4 to the edge of a glazing unit and engaging a plurality of ancillary elements according to any one of claims 1 to 4 therewith.

Patentansprüche

1. Set, das eine Mehrzahl von Glasscheibenthalteklammern, die an einer Verglasungseinheit befestigt werden, und eine Mehrzahl von Zusatzelementen umfasst, wobei jede Glasscheibenthalteklammer (2) einen im Allgemeinen U-förmigen Körper (4) umfasst, der eine Basis (10) und gegenüberliegende Arme (12, 14) aufweist, wobei die Basis dazu ausgestaltet ist, sich im Gebrauch über eine Kante einer Verglasungseinheit zu erstrecken, wobei sich jeder Arm über eine entsprechende Außenfläche einer Verglasungsplatte an gegenüberliegenden Seiten davon erstreckt, wobei jede Glasscheibenthalteklammer eine einteilige Konstruktion ist und einen aufrecht stehenden Abschnitt (6, 8) umfasst, der von jedem Arm vorspringt, der mit einem Zusatzelement (40, 42, 44) in Eingriff ist, das eine im Allgemeinen n-förmige georgianische Sprossenabdeckung umfasst, die dazu ausgestaltet ist, eine Verglasungsanordnung mit dem Effekt einer georgianischen Sprosse auf einer Verglasungsplatte bereitzustellen.
2. Set nach Anspruch 1, wobei die Arme der Glasscheibenthalteklammer von der Senkrechten relativ zur Basis geneigt sind, wobei im Gebrauch die Glasscheibenthalteklammer zur Verglasungseinheit geneigt ist.
3. Set nach Anspruch 1, wobei der aufrecht stehende Abschnitt eine Mehrzahl von gefälzten Abschnitten umfasst.

4. Set nach Anspruch 1, wobei der aufrecht stehende Abschnitt eine Pilzformation umfasst.
5. Set nach einem der vorhergehenden Ansprüche, wobei der Satz ferner eine Querstrebe zum Eingriff mit einem ersten Zusatzelement in eine erste Richtung und mit einem zweiten Zusatzelement in eine zweite Richtung umfasst.
6. Set nach Anspruch 5, wobei die Querstrebe ein erstes eingreifendes Element zum Eingriff mit einem ersten Zusatzelement und ein zweites eingreifendes Element zum Eingriff mit einem zweiten Zusatzelement umfasst.
7. Set nach Anspruch 6, wobei die Querstrebe ferner ein drittes eingreifendes Element zum Eingriff mit einem dritten Zusatzelement umfasst.
8. Set nach Anspruch 7, wobei die Querstrebe so ausgestaltet ist, dass ein erstes Zusatzelement im Wesentlichen senkrecht zu einem zweiten und einem dritten Zusatzelement sein wird.
9. Set nach Anspruch 7 oder Anspruch 8, wobei das erste eingreifende Element im Wesentlichen in Hinblick auf den Querschnitt ähnlich dem zweiten eingreifenden Element ist und/oder das erste eingreifende Element im Wesentlichen in Hinblick auf den Querschnitt ähnlich dem dritten eingreifenden Element ist.
10. Set nach einem der Ansprüche 7 bis 9, wobei das erste eingreifende Element im Wesentlichen senkrecht zum zweiten eingreifenden Element ist und/oder das erste eingreifende Element im Wesentlichen senkrecht zum dritten eingreifenden Element ist.
11. Set nach einem der vorhergehenden Ansprüche, wobei das Zusatzelement einen im Wesentlichen konstanten Querschnitt aufweist.
12. Set nach einem der vorhergehenden Ansprüche, wobei das Zusatzelement eine untere Fläche umfasst, die im Gebrauch an einer Verglasungsplatte anliegen soll, und wobei die Glasscheibenthalteklammer dazu ausgestaltet ist, mit dem Zusatzelement in der unteren Fläche in Eingriff zu sein.
13. Set nach Anspruch 12, wobei die untere Fläche einen Längsschlitz darin zur Aufnahme der Glasscheibenthalteklammer aufweist.
14. Set nach Anspruch 12 oder Anspruch 13, wobei das Zusatzelement und die Glasscheibenthalteklammer über eine Einrastverbindung in Eingriff sind.

15. Verglasungsanordnung, die eine Verglasungseinheit umfasst, um deren Kante eine Mehrzahl von Glasscheibenhalteklammern gemäß einem der Ansprüche 1 bis 4 und eine Mehrzahl von Zusatzelementen gemäß einem der Ansprüche 1 bis 4 sind, die mit den Glasscheibenhalteklammern in Eingriff sind.
16. Verfahren zur Konstruktion einer Verglasungsanordnung, wobei das Verfahren die Schritte des Bereitstellens einer Mehrzahl von Glasscheibenhalteklammern gemäß einem der Ansprüche 1 bis 4 für die Kante einer Verglasungseinheit und das Eingreifen einer Mehrzahl von Zusatzelementen gemäß einem der Ansprüche 1 bis 4 damit umfasst.

6. Kit selon la revendication 5, dans lequel la pièce transversale comprend un premier élément d'inter-engagement prévu pour s'engager mutuellement avec un premier élément additionnel, et un deuxième élément d'inter-engagement prévu pour s'engager mutuellement avec un deuxième élément additionnel.
7. Kit selon la revendication 6, dans lequel la pièce transversale comprend en outre un troisième élément d'inter-engagement prévu pour s'engager mutuellement avec un troisième élément additionnel.
8. Kit selon la revendication 7, dans lequel la pièce transversale est configurée de telle sorte qu'un premier élément additionnel soit sensiblement perpendiculaire à un deuxième et un troisième élément additionnel.

Revendications

1. Kit comprenant une pluralité d'attaches de vitre à agencer sur une unité de vitre et une pluralité d'éléments additionnels, chaque attache de vitre (2) présentant un corps essentiellement en forme de U (4) comprenant une base (10) et des bras opposés (12, 14), dans lequel la base est configurée pour s'étendre en travers d'un bord d'une unité de vitre, lors de l'utilisation, avec chaque bras qui s'étend au-dessus d'une face externe respective d'un panneau de vitre sur des côtés opposés de celui-ci, dans lequel chaque attache de vitre est une structure d'une seule pièce et comprend une partie verticale (6, 8) qui fait saillie à partir de chaque bras et qui s'engage mutuellement avec un élément additionnel (40, 42, 44) qui comprend une coiffe de barre armée essentiellement en forme de n configurée pour former un ensemble de vitre à effet de barre géorgienne sur un panneau de vitre.
2. Kit selon la revendication 1, dans lequel les bras de l'attache de vitre sont inclinés à partir de la perpendiculaire par rapport à la base, moyennant quoi lors de l'utilisation l'attache de vitre est poussée vers l'unité de vitre.
3. Kit selon la revendication 1, dans lequel la partie verticale comprend une pluralité de parties à recouvrement.
4. Kit selon la revendication 1, dans lequel la partie verticale comprend une formation de type champignon.
5. Kit selon l'une quelconque des revendications précédentes, dans lequel le kit comprend en outre une pièce transversale prévu pour s'engager mutuellement avec un premier élément additionnel dans une première direction et avec un deuxième élément additionnel dans une deuxième direction.
9. Kit selon la revendication 7 ou la revendication 8, dans lequel la section transversale du premier élément d'inter-engagement est sensiblement similaire à celle du deuxième élément d'inter-engagement et/ou la section transversale du premier élément d'inter-engagement est sensiblement similaire à celle du troisième élément d'inter-engagement.
10. Kit selon l'une quelconque des revendications 7 à 9, dans lequel le premier élément d'inter-engagement est sensiblement perpendiculaire au deuxième élément d'inter-engagement et/ou le premier élément d'inter-engagement est sensiblement perpendiculaire au troisième élément d'inter-engagement.
11. Kit selon l'une quelconque des revendications précédentes, dans lequel l'élément additionnel présente une section transversale sensiblement constante.
12. Kit selon l'une quelconque des revendications précédentes, dans lequel l'élément additionnel présente une face inférieure qui s'appuie contre un panneau de vitre lors de l'utilisation, et l'attache de vitre est configurée de manière à s'engager mutuellement avec l'élément additionnel dans la face inférieure.
13. Kit selon la revendication 12, dans lequel la face inférieure comporte une fente longitudinale qui est destinée à recevoir l'attache de vitre.
14. Kit selon la revendication 12 ou la revendication 13, dans lequel l'élément additionnel et l'attache de vitre s'engagent mutuellement par une connexion d'encliquetage.
15. Ensemble de vitre comprenant une unité de vitre autour du bord de laquelle sont disposées une pluralité d'attaches de vitre selon l'une quelconque des revendications 1 à 4 et une pluralité d'éléments ad-

ditionnels selon l'une quelconque des revendications 1 à 4 engagés avec les attaches de vitre.

- 16.** Procédé de construction d'un ensemble de vitre, le procédé comprenant les étapes consistant à fournir une pluralité d'attaches de vitres selon l'une quelconque des revendications 1 à 4 au bord d'une unité de vitre, et engager une pluralité d'éléments additionnels selon l'une quelconque des revendications 1 à 4 avec celles-ci.

5

10

15

20

25

30

35

40

45

50

55

7

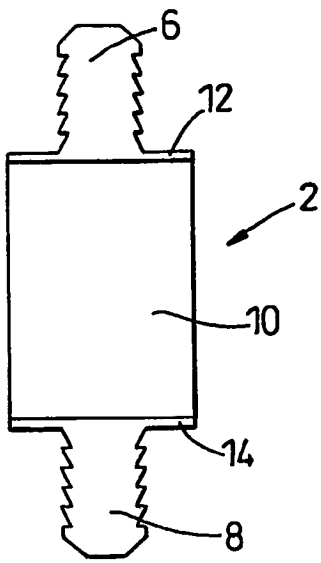


Fig. 1

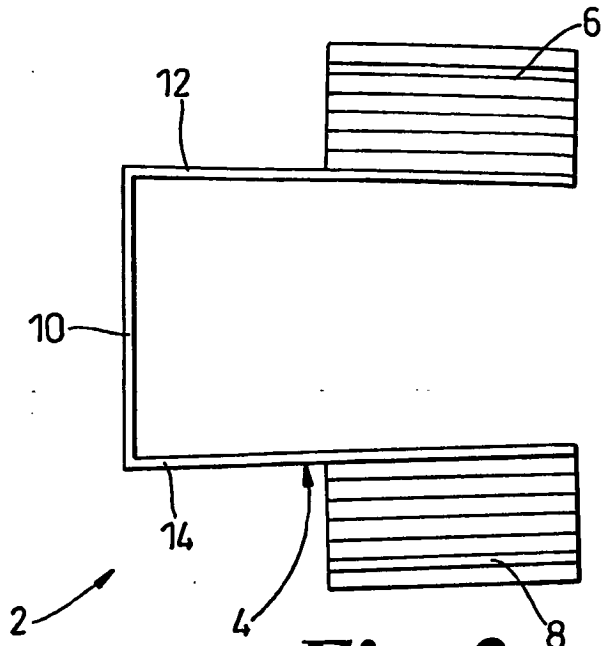


Fig. 2

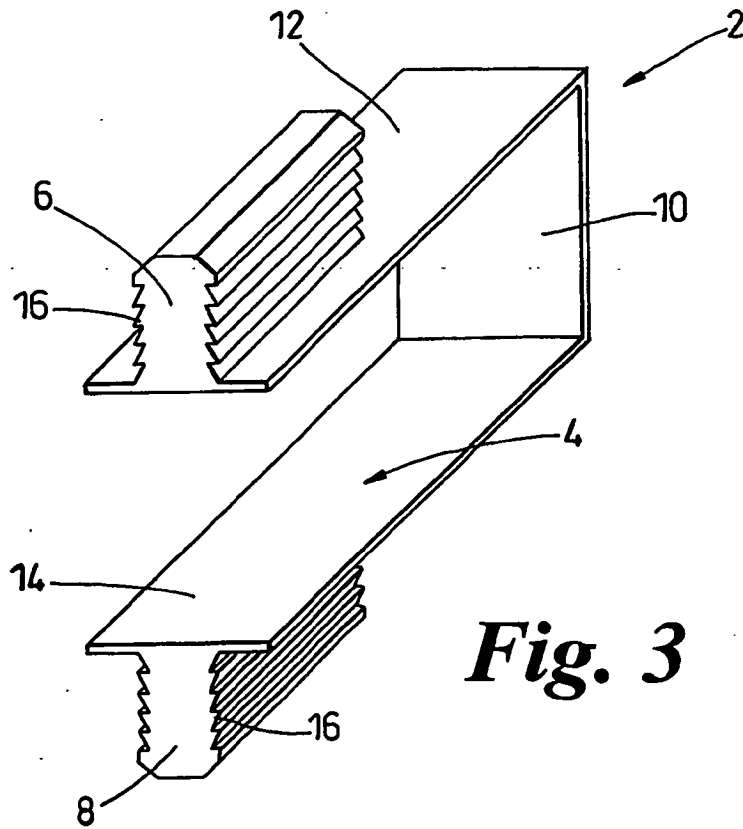


Fig. 3

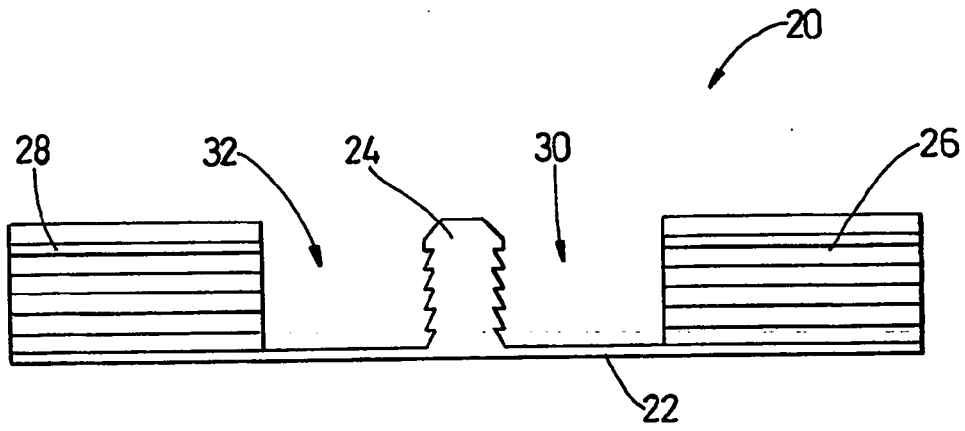


Fig. 4

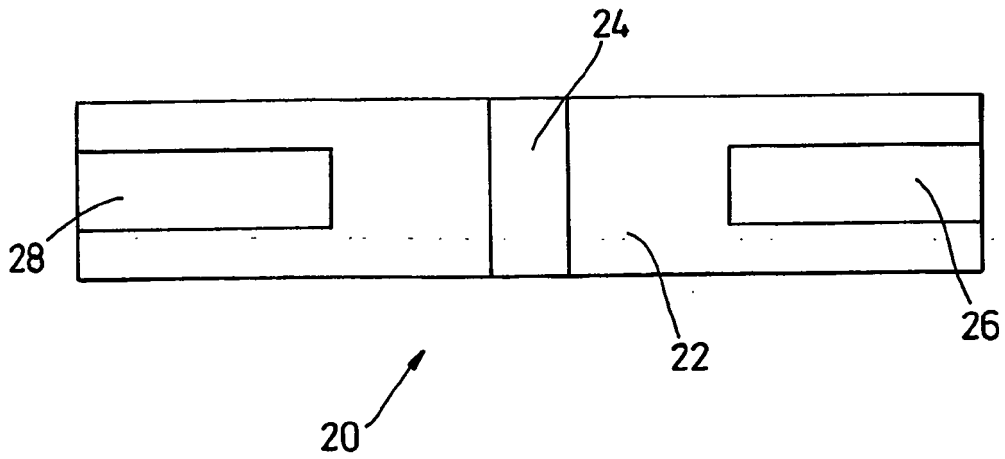


Fig. 5

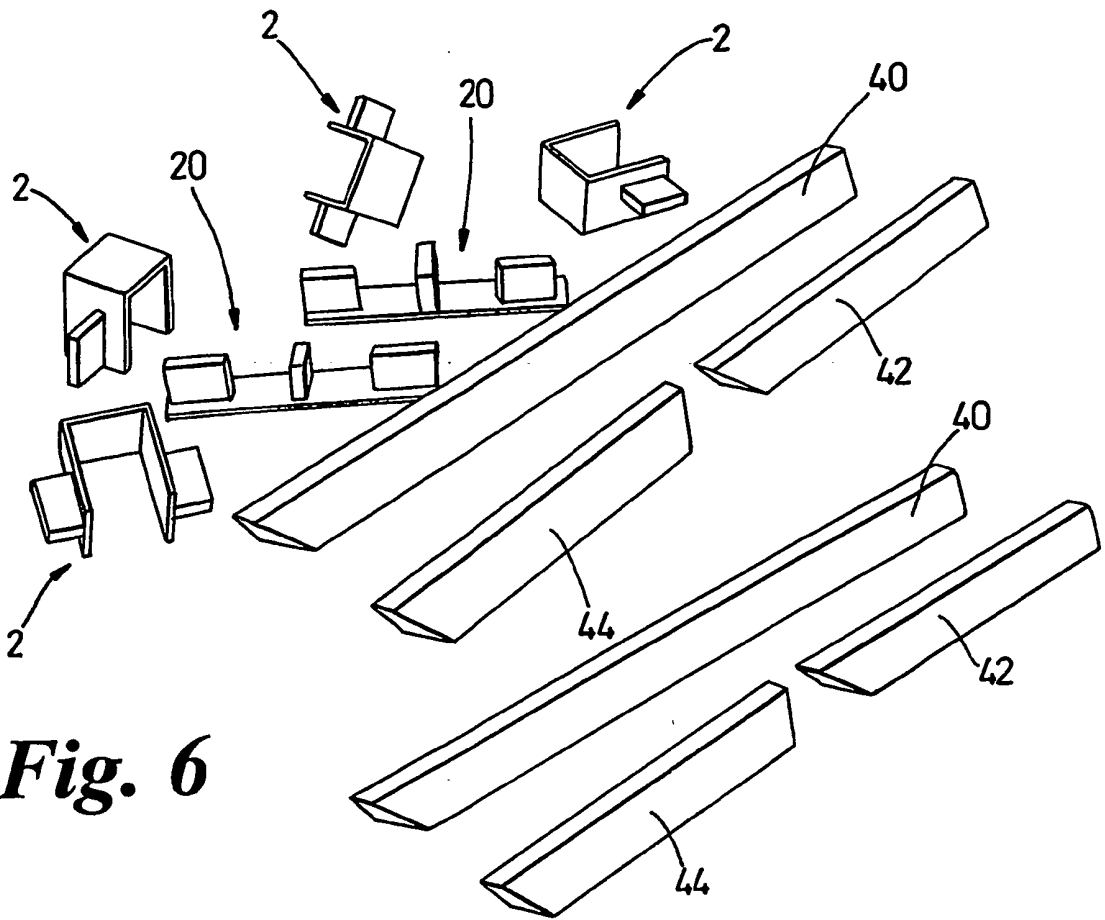


Fig. 6

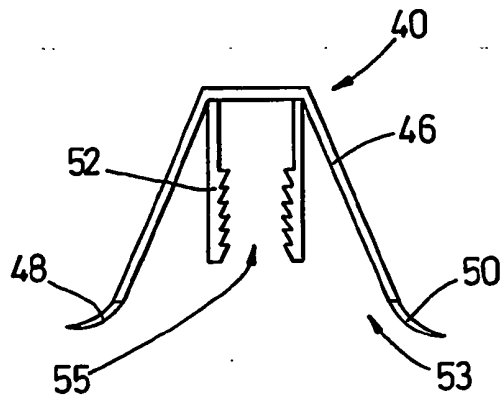


Fig. 7

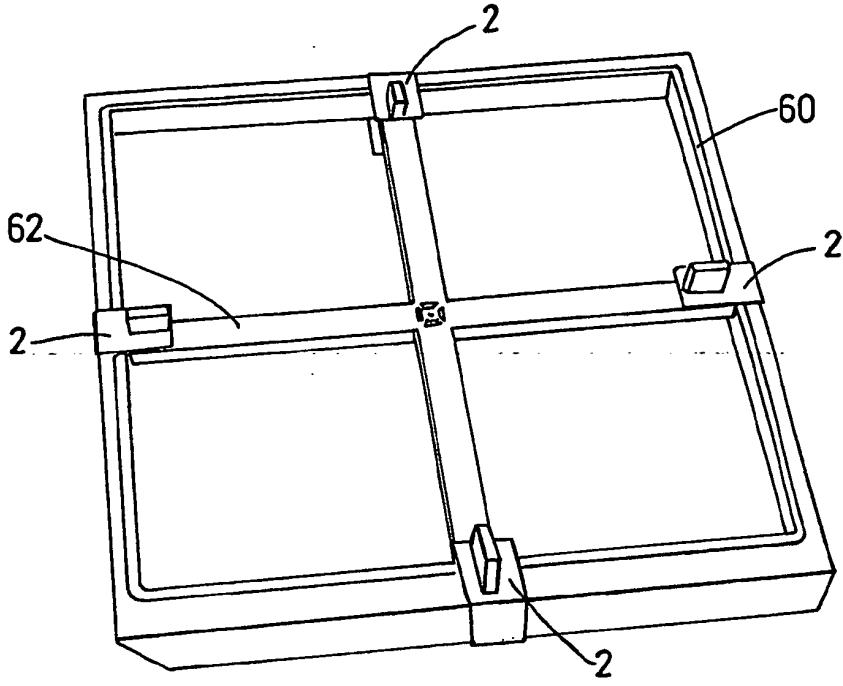


Fig. 8

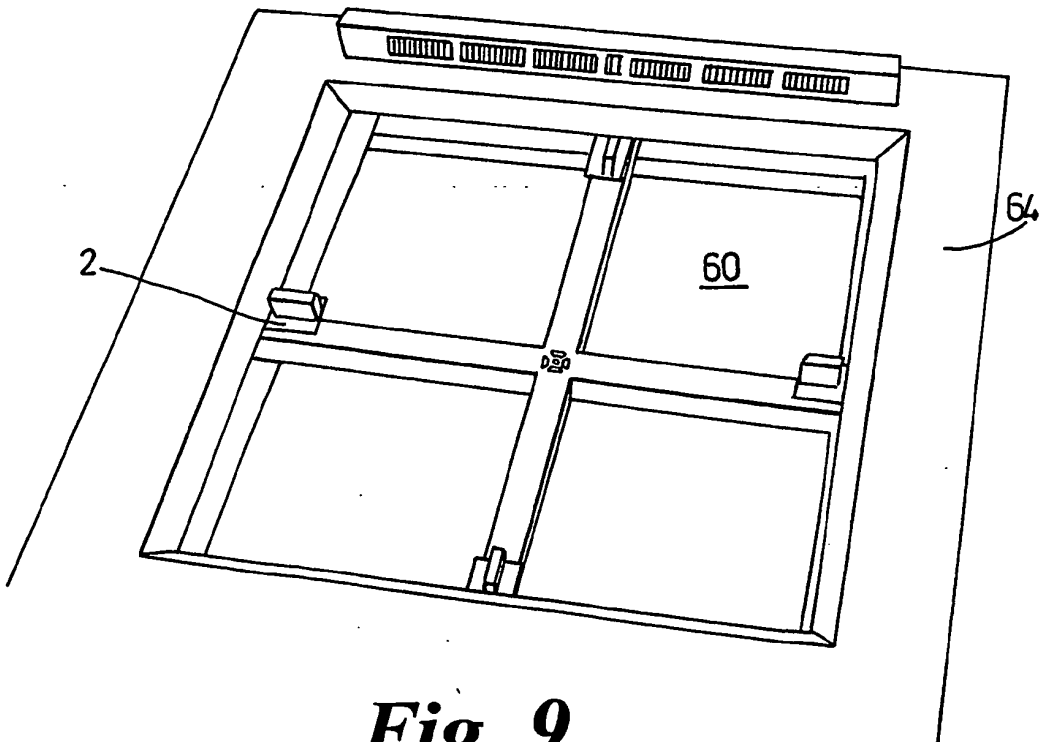


Fig. 9

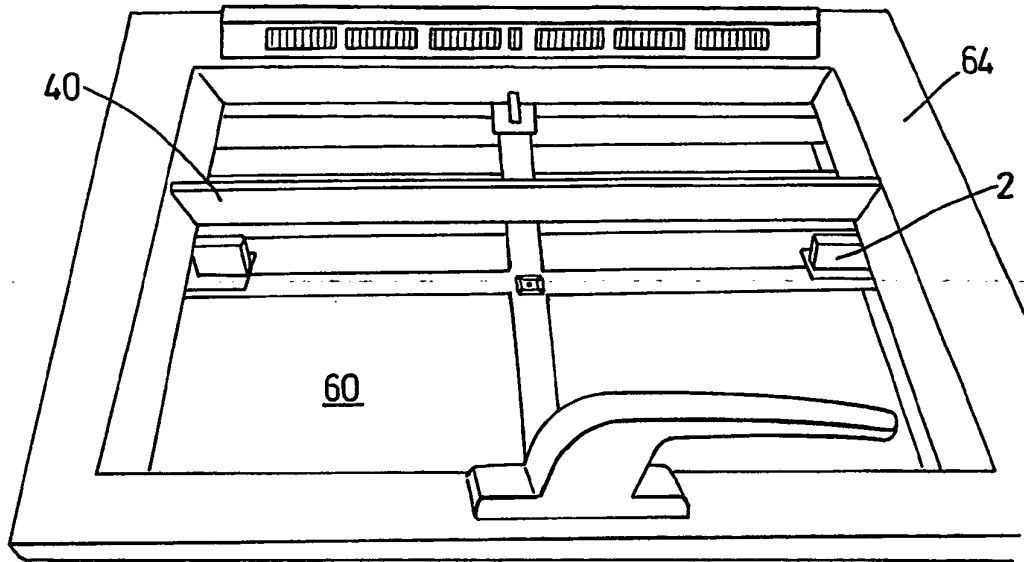


Fig. 10

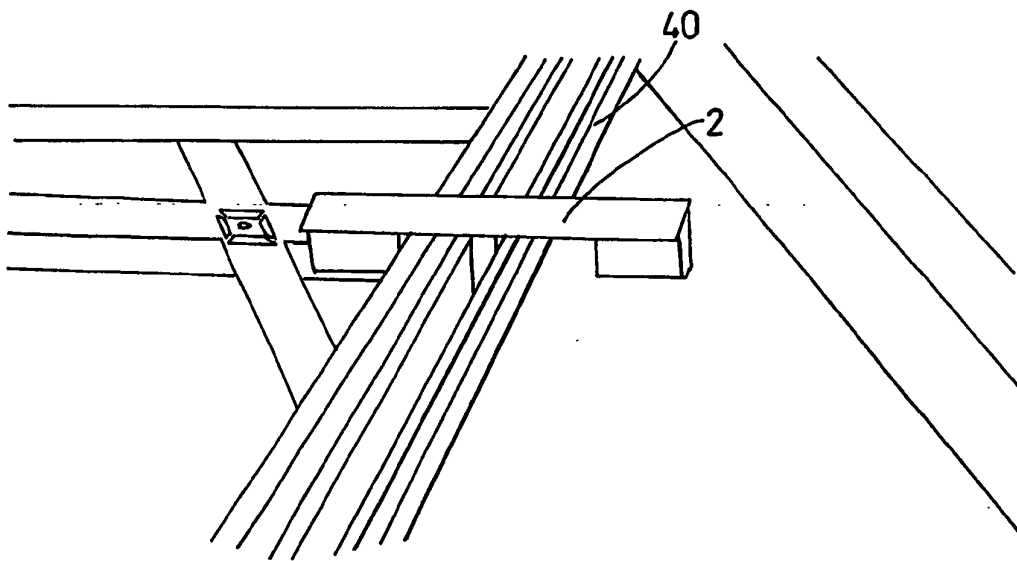


Fig. 11

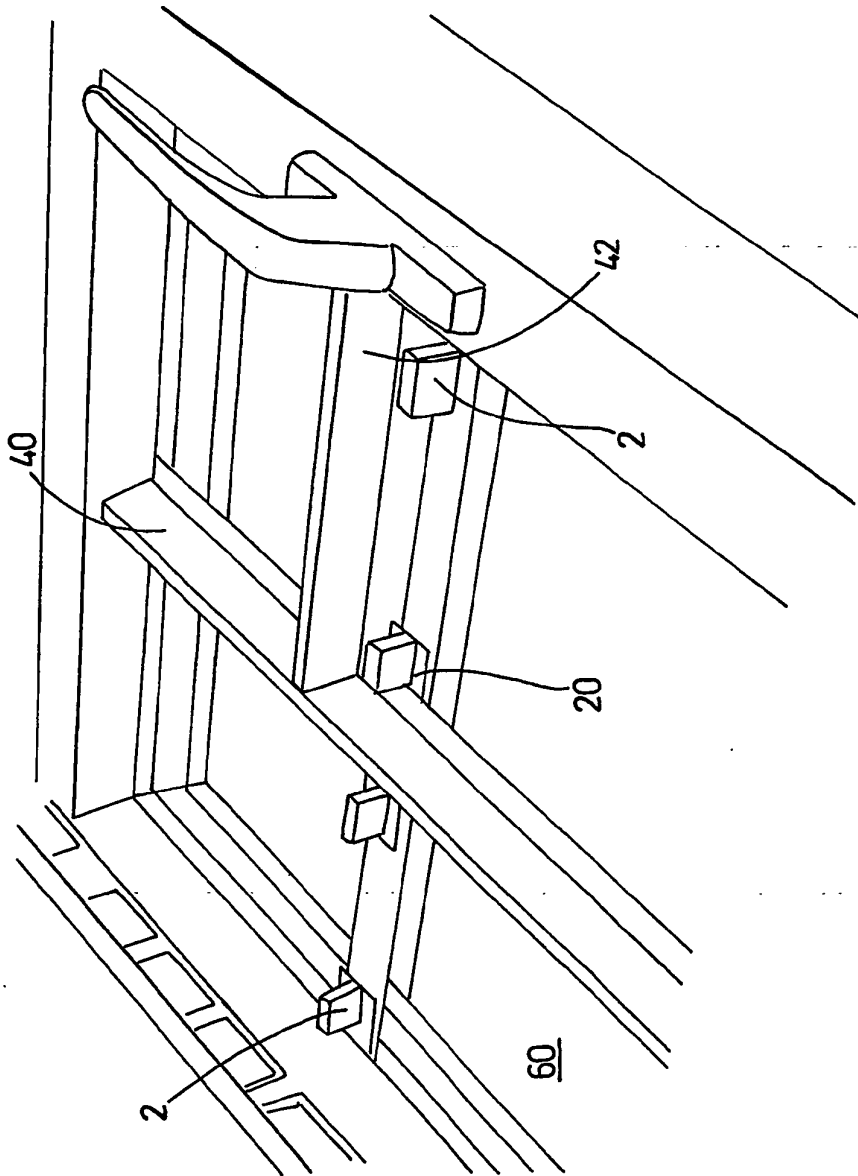


Fig. 12

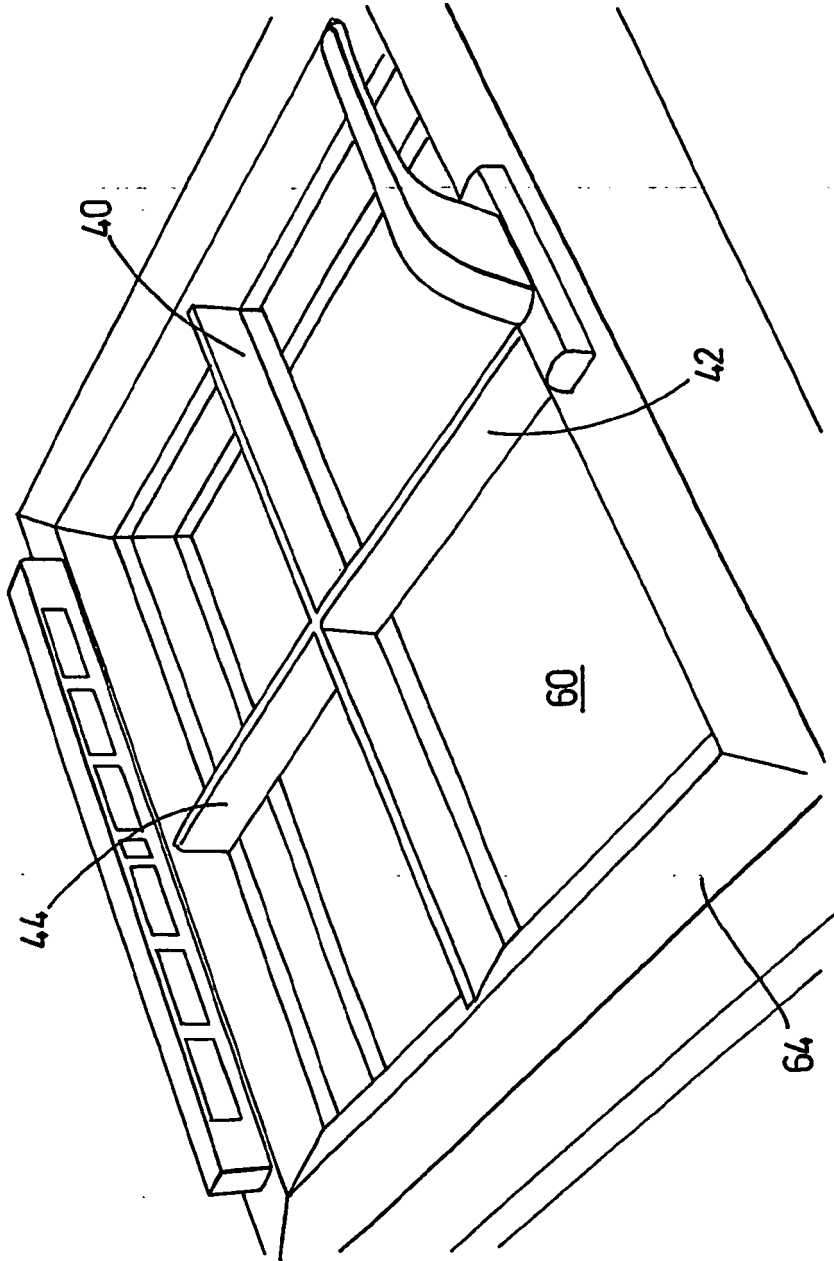


Fig. 13

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 2854709 A [0005]
- US 2723427 A [0006]
- US 2637423 A [0007]
- GB 659839 A [0008]
- GB 2010948 A [0009]
- US 2934180 A [0010]
- EP 0152813 A [0011]